UniquifyAI™

A Global Strategy on AI & LLM Resource

UniquifyAI Upskilling SUCCESS

Uniquify engineer ai

❖ A Global Challenge:
Quality & Quantity of AI engineering resource

Curriculum

Tailored for SW engineers
with no prior AI knowledge

Based on 200+ AI research papers

Lab Training

Hands-on training
for SW engineers with Python

100+ AI basic training
100+ LLM training

Teaching

Experienced Staff
knows how to upskill

Training SW engineers for 7 years

aws

"AI is going to be the most transformative technology we encounter in our generation, but it won't reach its full potential unless we really have the workforce ready to embrace it and turbocharge it in a big way," said Swami Sivasubramanian, Amazon's vice president of data and AI.

UniquifyAI Basic Curriculum

Tailored to train SW engineers who has no prior knowledge of AI technologies
- ❖ Curriculum covers all must-learn technologies in AI, ML, NN, LM, & important AI models
- ❖ 100+ Practical training / Lab material ensures hands-on AI experience

- **AI / ML Intro**
  - AI basics
  - AI vs. SW
  - AI applications
  - ML basics
  - Learning & training
  - Supervised vs. unsupervised
  - Regression vs. classification
  - Inference
  - Data
  - MNIST & ImageNet
  - Neuron basics
  - MAC
  - Activation functions
  - Neural Network basics
  - NN structure
  - NN Linear Algebra
- **Fully Connected Neural Net**
  - FCNN structure
  - SoftMax
  - Fully vs. partial connection
  - Residual connect
  - Data augmentation
  - Data x param vs data x data

- **Convolutional Neural Net**
  - Convolution Math
  - Filters / Kernels
  - Padding & stride
  - Feature map
  - Dimensionality reduction
  - Max Pooling
  - CNN structure
  - Receptive field
  - Divide & conquer
  - Depthwise & Separable Conv

- **Recurrent Neural Net**
  - RNN basics
  - Sequence Data
  - Elman net vs. Jordan
  - RNN math
  - Bi-directional RNN
  - LSTM
  - Deep RNN
  - Attention / Alignment
  - Transduction models

- **Other Neural Net**
  - Auto Encoder
  - Generative Adversarial Net (GAN)
  - Capsule Net

- **Optimization**
  - Training basics
  - Forward & backprop
  - Calculus basics
  - Gradient
  - Initialization
  - Back prob & chain rule
  - Backprop case study
  - SGD
  - Momentum
  - Adaptive Gradient (AdaGrad)
  - Root Mean Square Prop (RMSProp)
  - Adaptive Moment Estimation (ADAM)
  - Regularization
  - Batch Norm / Layer Norm
  - Dropout
  - Gradient clipping

- **Reinforcement Learning (RL)**
  - Bellman equation
  - Markov Decision Process (MDP)
  - Q-learning
  - NN as Q table
  - Case study: RL with Atari game

- **Language Model Intro**
  - Probability basics
  - Sequence data
  - Perplexity
  - Word vectors
  - Bag of words model

- **Models**
  - Image classification (AlexNet)
  - Object detection (YOLO)
  - Object Segmentation
  - Image captioning
  - Facial recognition (VGG Face)
  - Speech recognition
  - Machine translation
  - Language model

UniquifyAI LLM **Curriculum**

Due to rapid LLM advancement over the past few years:

❖ There is no textbook or school courses to cover all LLM related technologies.
❖ UniquifyAI curriculum is consisted of 218 research papers (102 LLM, 59 GPT, 57 Dataset)
❖ 100+ Practical training / Lab material guides engineers to have hands-on LLM experience

- **Word Embedding (8)**
  - BOW model
  - Bi-gram & n-gram model
  - Skip n-gram model
  - GloVe
  - CoVe
  - Pre-ELMo
  - ELMo

- **General (18)**
  - Output decoding
  - Beam search
  - MIPS
  - RMSNorm
  - Gradient surgery

- **Question Answering (11)**
  - Baseball
  - Pointer Net
  - SQuAD
  - Machine Comprehension
  - Span Embedding
  - DrQA
  - BERT: Natural Questions
  - ORQA

- **Transformer (9)**
  - Attention
  - Sentence embedding
  - Self attention
  - Transformer
  - Softmax derivative
  - Transformer-XL
  - Megatron-LM
  - RoFormer
  - Infinite context

- **Transfer Learning (15)**
  - ULMFiT
  - Natural Language Decathlon
  - STILTs
  - ELMo's friends
  - Unifying QA with Span Ext
  - MASS
  - UniLM
  - XLNet
  - T5 & C4
  - Unified QA
  - Billions words pre-training
  - ExMix & ExT5

- **GPT (59)**
  - GPT (10)
  - GPT-2 (8)
  - GPT-3 (14)
  - GPT-3.5 (21)
  - GPT-4 (5)

- **BERT (9)**
  - BERT
  - Passage re-ranking
  - Ad-hoc doc retrieval
  - SpanBERT
  - RoBERTa
  - ALBERT
  - BART
  - Llama (3)
  - Gemma (1)

- **Scaling (8)**
  - Deep Learning Scaling
  - Scaling Law
  - Scaling Law for ARG
  - Gopher
  - Inverse scaling
  - U-shape scaling

- **Dataset (57)**
  - LLM pre-training
  - Text Classification
  - Name Entity Recognition (NER)
  - Part of Speech (POS)
  - Natural Language Inference (NLI)
  - Machine Translation (MT)
  - Sentiment Analysis
  - Question Answering (QA)
  - Semantic Role Labeling (SRL)
  - Text Summarization
  - Semantic Similarity
  - Linguistic Acceptability
  - Dialogue Conversation
  - Social Test
  - Programming Language Processing
  - …

- **RAG (4)**
  - REALM
  - Dense Passage Retrieval
  - Context affects LM's
  - RAG

AI Talent Classification

Uniquify's GenAI talent strategy is based on L1 & L2 GenAI resources to provide talent-ware solutions for enterprises, governments, and educational institutions.

L5 — AI Architect

GPT-4 | MOE | RLHF | MMLU | ...

L4 — AI Manager

MOE | GPT-3 | ...
AGENT ALIGNMENT |
IGPT | SPARSE TRANSFORMER |
RLHF | SUPERGLUE | PARAMETER-SCALING | FEW SHOT | LEARNING |

L3 — AI Lead

GLUE | CAT FORGET | TRAIN CURRI | GPT-2 | ...
META LEARNING | ZERO SHOT | MAML | MQAN | DECANLP |
UNILM | SPANBERT | ROBERTA | T5 | MULTITASK LEARNING |
RAG | REALM | TRANSFORMER-D | BERT | BARD | GPT | MASS |

L2 — AI Engineer

SPAN EMBED | POINTER NET | SQUAD | ...
DRQA | TRANSFORMER | GPT | SEMANTIC SIMILARITY |
RACE | STORYCLOZE | SNLI | MNLI | STSB | SST | COLA | TOKENI-ZATION |
BPE | BEAM SEARCH | LABEL SMOOTHING | QA | NLI | TEXT CLASSIFICATION | PRE-TRAINING | SELF-ATTENTION | SENTENCE EMBEDDING | MULTIHEAD ATTENTION | OUT DECODE |

L1 — AI Jr. Engineer

DROPOUT | REGULARIZATION | BATCH NORM | RESIDUAL LAYER | RESNET | VGG16 | YOLO | ...
FACENET | CNN | FFNN | RNN | AE | LSTM | BILSTM | ATTENTION | WORD EMBEDDING | ADAM | OVERFITTING |
| SGD | REGRESSION/CLASSIFICATION | SUPERVISED/UNSUPERVISED/REINFORCEMENT LEARN | PERCEPTRON | MLP |
SW 3+ YEARS | PYTHON 1+ YEARS | UNIX/LINUX 1+ YEARS | ML/NN BASICS | LINEAR ALGEBRA | VECTOR MATH | ACTIVATION |
...

Legend:
- L5
- L4
- L3
- L2
- L1

ChatGPT Tech Tree